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Flowers and insects. XII.

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CLEMATIS VIRGINIANA L.—The flower, with its horizontally expanded sepals, measures about 2^{cm} across. The flower clusters form large, white masses upon the shrubs upon which the plants climb. The flowers are dioecious. The white color and the easily accessible nectar attract numerous, mostly small, short-tongued insects. The visitors, however, are principally flies, three-fifths of the species being of this kind.

An interesting comparison may be made between this plant and *Isopyrum biternatum*, an account of which is given in the GAZETTE, 17: 173-5. 1892. The flowers of both species are white, though the Clematis is more conspicuous, and the extent of nectar concealment is almost identical. Nevertheless, the species show a marked difference in the kinds of insects visiting them, as the following table will show:

	BEES.	OTHER HYMENOP.	SYRPHIDÆ.	TACHINIDÆ.	MUSCIDÆ.	OTHER DIPTERA.	OTHER INSECTS.	TOTAL.
<i>Isopyrum biternatum</i>	31	0	10	1	1	2	5	50
<i>Clematis Virginiana</i>	9	10	6	10	7	11	2	55

The difference is mainly a result of the time of blooming. *Isopyrum*, according to my observations, blooms from March 24th to May 12th, and *Clematis Virginiana* from July 11th to Aug. 16th. During the blooming time of the former, bees are almost as abundant as during the blooming time of the latter. Of the lower aculeate Hymenoptera I have never seen in my neighborhood more than six species during the period of *Isopyrum*, though they become more abundant about the time the plant goes out of bloom; but they reach their maximum during the period of *Clematis Virginiana*, within which time I have noted 115 species flying simultaneously.

Then *Isopyrum* is exposed to a tachinid fauna of only six species also, while the *Clematis* is exposed to thirty or more

species. The *Muscidæ* are also more abundant while *Clematis Virginiana* is in bloom. It seems that bees and *Syrphidæ*, therefore, are less abundant on the *Clematis* on account of the competition of the lower Hymenoptera and the other Diptera.

As far as I have observed in my neighborhood, this is the latest blooming of the Ranunculaceæ. By late blooming it gains the signal advantage of avoiding competition with such allies as *Ranunculus*, *Isopyrum*, *Anemonella*, etc., and it finds the general anthophilous insect fauna at its maximum. Its period overlaps with the periods of *C. Pitcheri* and *Anemone Virginiana*. *C. Pitcheri*, its congener, is hardly a competitor, since, as observed below, it is adapted to bumble-bees. The *Anemone*, being a pollen flower, also avoids competition to some extent by attracting a different set of insects.

The following insects were taken from the staminate flowers on July 27th, 28th, 30th and August 3d:

HYMENOPTERA.—*Apidæ*: (1) *Apis mellifica* L. ♀, s.; (2) *Bombus virginicus* Oliv. ♀, s. and c. p.; *Andrenidæ*: (3) *Halictus zephyrus* Sm. ♂♀, s. and c. p.; (4) *H. confusus* Sm. ♂♀, s. and c. p.; (5) *H. stultus* Cr. ♂♀, s. and c. p., the most abundant visitor; (6) *H. cressonii* Rob. ♂; (7) *Sphecodes arvensis* Ptn. ♂, s.; (8) *S. confertus* Say ♀, s.; (9) *Prosopis affinis* Sm. ♂♀, s.; *Eumenidæ*: (10) *Odynerus tigris* Sauss., s.; (11) *O. foraminatus* Sauss., s.; *Crabronidæ*: (12) *Crabro minimus* Pk., s.; (13) *C. interruptus* Lep., s.; (14) *Oxybelus 4-notatus* Say, s.; *Nyssonidæ*: (15) *Nysson plagiatu*s Cr., s.; *Sphecidae*: (16) *Pelopoeus cemenrarius* Dru., s.; (17) *Isodontia philadelphia* Lep., s.; (18) *Sphex ichneumonea* L., s.; *Scoliidae*: (19) *Scolia bicincta* F., s.

DIPTERA.—*Conopidae*: (20) *Oncomyia loraria* Lw., s.; *Syrphidae*: (21) *Platychirus quadratus* Say; (22) *Allograpta obliqua* Say; (23) *Mesograpta marginata* Say; (24) *Sphaerophoria cylindrica* Say; (25) *Eristalis transversus* Wd.; (26) *Syritta pipiens* L.; *Tachinidae*: (27) *Exorista* sp.; (28) *Loewia globosa* Twns.; (29) *Hyalomyia purpurascens* Twns.; (30) *Jurinia apicifera* Wlk.; (31) *J. smaragdina* Mcq.; (32) *Micropalpus fulgens* Mg.; (33) *Frontina flavicauda* Riley; (34) *Siphona illinoensis* Twns.; (35) *Miltogramma argentifrons* Twns.; (36) *Sarcomacronychia aurifrons* Twns.; *Sarcophagidae*: (37) *Sarcophaga* sp.; *Muscidae*: (38) *Calliphora erythrocephala* Mg.; (39) *Graphomyia* sp.; (40) *Lucilia* sp.; (41) L.

latifrons Schin.; (42) *L. cornicina* F.; (43) *Compsomyia macellaria* F.; (44) *Musca domestica* L.; *Anthomyidae*: (45) *Homalomyia canicularis* L.; (46) *Anthomyia albicincta* Fll.; (47-48) *Chortophila* spp.; *Sepsidae*: (49) *Sepsis* sp.; *M. acalyptratae*: (50-53) spp.—all sucking.

LEPIDOPTERA.—*Lycaenidae*: (54) *Lycaena pseudargiolus* B.-L., s.

HEMIPTERA.—*Capsidae*: (55) *Lopidea media* Say, s.

CLEMATIS PITCHERI Torr. and Gray.¹—In this case we have a bumble-bee flower produced by a very simple modification. The sepals, instead of being expanded horizontally so as to admit all sorts of insects to the pollen produced in the anthers, and to the nectar secreted by the filaments, are thick and rigid and have their edges so closely approximated that bees are only admitted at the small opening formed by their separating tips.

The flower is nodding and is purplish exteriorly. It measures about 2^{cm} long and opens to the extent of 5^{mm}. The tips of the sepals are pointed and reflexed, so as to form foot-holds for the visiting bumble-bees. As observed above, nectar is secreted by the filaments. After a bee has inserted its head as far as it will go, it still needs a proboscis from 12 to 15^{mm} long to exhaust the nectar supply.

In newly opened flowers, the stigmas are so far advanced (4^{mm}) before the anthers that cross-pollination very readily occurs by the bees touching them before disturbing the pollen. Later, when the inner anthers dehisce, spontaneous self-pollination may occur by these anthers, which finally equal the stigmas, coming in contact with the latter.

I have seen the flowers visited for nectar by *Bombus vagans* Sm. ♀, and by *Volucella vesiculosa* F.

RANUNCULUS SEPTENTRIONALIS Poir.—The plant is common, growing in scattered patches in low, rich soil. At first the flowers rise 1 or 2^{dm}, the stems finally elongating so as to hold them above the surrounding grass. The spreading stems bear only a few open flowers at a time, which renders them less conspicuous, but increases the probability of cross-pollination between flowers of distinct plants.

¹This plant resembles *C. Viorna*, which is described and figured by Foerste in *Am. Nat.* 19: 397. 1885.

The bright yellow petals expand horizontally, the flower measuring 2 or 3^{mm} across.

The flower is proterogynous. The styles elongate, holding their receptive stigmas above the anthers, which at first are all closed. The outer stamens lengthen and discharge first, the dehiscence being extrorse.

There is abundant opportunity for cross-pollination before the anthers begin to discharge. Later cross- or self-pollination may occur by insect aid. There is no doubt that self-pollination depends mainly upon the visits of insects. If, however, the stigmas remain untouched until the inner anthers discharge, spontaneous self-pollination may occur by pollen falling upon the stigmas, since the inner filaments finally lengthen so as to hold the dehiscent anthers over the stigmas. The plant was observed in bloom from April 8th to May 24th. On six days, between April 16th and May 7th, the following list of visitors was observed:

HYMENOPTERA.—*Apidae*: (1) *Synhalonia belfragei* Cr. ♂, s.; (2) *Ceratina tejonensis* Cr. ♂, s.; (3) *C. dupla* Say ♂♀, s. and c. p., ab.; (4) *Osmia albiventris* Cr. ♂♀, s. and c. p., ab.; (5) *O. conjuncta* Cr. ♀, c. p.; (6) *O. lignaria* Say ♀, s. and c. p.; (7) *O. cognata* Cr. ♂, s.; *Andrenidae*: (8) *Andrena polemonii* Rob. ♂♀, s. and c. p., ab.; (9) *A. cressonii* Rob. ♀, s. and c. p.; (10) *A. ziziae* Rob. ♂, s.; (11) *Augochlora labrosa* Say ♀, s.; (12) *A. pura* Say ♀, s. and c. p., ab.; (13) *Halictus 4-maculatus* Rob. ♀, s.; (14) *H. pectoralis* Sm. ♀, s. and c. p.; (15) *H. coriaceus* Sm. ♀, s. and c. p.; (16) *H. lerouxii* Lep. ♀, s. and c. p.; (17) *H. ligatus* Say ♀, s. and c. p.; (18) *H. fasciatus* Nyl. ♀, s. and c. p.; (19) *H. pilosus* Sm. ♀, s. and c. p.; (20) *H. obscurus* Rob. ♀, s. and c. p.; (21) *H. stultus* Cr. ♀, s.; (22) *H. zephyrus* Sm. ♀, s.; (23) *Sphecodes dichroa* Sm. ♂, s.

DIPTERA.—*Bombylidae*: (24) *Bombylius pulchellus* Lw., s., one; (25) *B. fratellus* Wd., s.; *Syrphidae*: (26) *Pipiza pistica* Will., f. p.; (27) *P. femoralis* Lw., f. p.; (28) *Chilosia capillata* Lw., s. and f. p., ab.; (29) *Melanostoma obscurum* Say, s. and f. p.; (30) *Syrphus ribesii* L., s. and f. p.; (31) *S. americanus* Wd., s. and f. p.; (32) *S. arcuatus* Fll., f. p.; (33) *Mesograpta geminata* Say, f. p.; (34) *Sphærophoria cylindrica* Say, f. p.; *Tachinidae*: (35) *Siphona illinoensis* Twms., s.; *Muscidae*: (36) *Cyrtoneura* sp.; *Anthomyidae*: (37) *Hydrophoria* sp., s.; (38) *Homalomyia* sp., s.; (39–40) *Anthomyia* spp., s.; (41–42) *Chortophila* sp., s.

COLEOPTERA.—*Carabidæ*: (43) *Lebia viridis* Say; *Coccinellidæ*: (44) *Megilla maculata* DeG., f. p.; *Chrysomelidæ*: (45) *Diabrotica vittata* F., f. p.; *Ædemeridæ*: (46) *Asclera ruficollis* Say, f. p.; *Anthicidæ*: (47) *Corphyra terminalis* Say, f. p.; *Curculionidæ*: (48–49) *Centrinus* spp., f. p.

LEPIDOPTERA.—*Hesperidæ*: (50) *Nisoniades juvenalis* F., s.; (51) *N. brizo* B.-L., s.; (52) *Eudamus bathyllus* S.-A., s.

RANUNCULUS FASCICULARIS Muhl.—This is the common early buttercup, blooming from March 24th to May 19th. The stems rise about 1^{dm}. Each plant commonly shows only one or two open flowers at a time, so that in this case pollination between distinct plants is apt to occur; but well developed plants often show several flowers, when pollination is more likely to take place between flowers of the same plant.

The flowers are bright yellow, expanding from 15 to 25^{mm}. Newly opened flowers are less widely spread. They show the indehiscent anthers crowded in a compact mass, and the stigmas surpassing them by 1–2^{mm}. At this time, the stigmas are receptive, and I have often found them thoroughly dusted with pollen which must have come from other flowers. The flowers are therefore proterogynous and are generally cross-pollinated. In older flowers the petals are lengthened and more expanded. The stamens also lengthen and finally overtop the stigmas, the anthers nearly concealing them. At this time, if fertilization has not already taken place, spontaneous self-pollination may readily occur by the stigmas receiving pollen from the anthers which now overtop them, and often touch them, as in the preceding.

On account of its earlier blooming, its more scattered habit, and the more exposed situations in which it grows, *R. fascicularis* is not so abundantly visited by insects as is the case with *R. septentrionalis*, though it shows a very similar list.

The following visitors were observed on six days, between April 11 and May 5:

HYMENOPTERA.—*Apidæ*: (1) *Apis mellifica* L. ♂, s.; (2) *Ceratina tejonensis* Cr. ♂, s.; (3) *C. dupla* Say ♂♀, s., freq.; (4) *Osmia albiventris* Cr. ♂♀, s., freq.; (5) *Nomada sayi* Rob. ♂, s.; *Andrenidæ*: (6) *Andrena violæ* Rob. ♂, s.; (7) *A. cressonii* Rob. ♀, s.; (8) *A. flavo-clypeata* Sm. ♂, s.; (9) *Halictus pectoralis* Sm. ♀, s. and c. p.; (10) *H. coriaceus* Sm. ♀, s.; (11) *H. ligatus* Say ♀, s. and c. p.; (12) *H. fasciatus* Nyl. ♀, s. and c. p.; (13) *H. pilosus* Sm. ♀, s.; (14) *H. confusus* Sm. ♀, s.,

freq.; (15) *H. pruinus* Rob. ♀, s. and c. p.; (16) *H. stultus* Cr. ♀, s.; (17) *Augochlora pura* Say ♀, s. and c. p., freq.; (18) *Agapostemon radiatus* Say ♀, s. and c. p., freq.

DIPTERA.—*Bombyliæ*: (19) *Bombylius fratellus* Wd., s.; *Syrphidæ*: (20) *Chilosia capillata* Lw., s.; (21) *Melanostoma mellinum* L.; (22) *Syrphus arcuatus* Fll., s.; (23) *S. americanus* Wd.; (24) *Mesograpta marginata* Say, s. and f. p., freq.; (25) *M. geminata* Say, s., freq.; (26) *Sphaerophoria cylindrica* Say, s. and f. p.; (27) *Eristalis transversus* Wd., f. p.; (28) *Xylota fraudulosa* Lw., s.; *Tachinidæ*: (29) *Gonia frontosa* Say, s., freq.; *Sarcophagidæ*: (30) *Sarcophaga* sp., s.; *Muscidæ*: (31) *Lucilia cornicina* F., s.; *Anthomyidæ*: (32) *Chortophila* sp., s., freq.

LEPIDOPTERA.—*Papilionidæ*: (33) *Colias philodice* Godt., s.

COLEOPTERA.—*Ædmeridæ*: (34) *Asclera ruficollis* Say, f. p.

RANUNCULUS ABORTIVUS L.²—Although apparently in need of a chance to pollinate its stigmas with pollen from its own stamens, as in the cases of *R. fascicularis* and *septentrionalis*, the flowers of this species do not seem to be able to effectually self-pollinate.

Newly opened flowers have receptive stigmas before the anthers dehisce and are consequently proterogynous. Soon the outer anthers begin to dehisce extrorsely and early become reflexed. At this time the central carpels are above and entirely out of reach of the anthers. Later the stamens lengthen, but then the same carpels are still removed by the elongation of the receptacle. The lower pistils, however, may receive pollen directly from the surrounding anthers, when these have dehisced.

The stems grow from 1-4^{dm} high, and bear numerous small flowers about 5-8^{mm} wide. The petals are minute, and bear nectar pits on their bases, not protected by a scale. Although the flowers are quite inconspicuous, as compared with the two preceding species, under favorable conditions they attract insects in sufficient numbers to insure cross-pollination. But it would take long and patient watching to make out a list equal to the lists of either *R. septentrionalis*, or *fascicularis*. On the 5th of May I noted as visitors:

HYMENOPTERA.—*Andrenidæ*: (1) *Andrena ziziae* Rob. ♂, s., freq.; (2) *Halictus stultus* Cr. ♀, s. and c. p.; (3) *Augochlora pura* Say ♀, s.

²See Meehan: Contributions to the Life-Histories of Plants, VII., Proc. Acad. Nat. Sci. Philad., 1892.

COLEOPTERA.—*Coccinellidae*: (4) *Megilla maculata* DeG., f. p.; (5) *Coccinella 9-notata* Hbst., s.

The three species of *Ranunculus*, an account of which has been given above, are in competition with one another and with other members of the genus, as well as with other members of the order, such as *Isopyrum*, *Anemonella*, *Myosurus*, *Hydrastis*, etc. In the period from the latter part of April to the middle of May, which is the maximum period of *Ranunculaceæ*, *Delphinium tricornes* and *Aquilegia Canadensis* are also in bloom, but they can hardly be regarded as competitors, since the former is adapted to bumble-bees and the latter to humming-birds.³

HYPERICUM CISTIFOLIUM Lam.—The stems grow from 3–6^{dm} high and are often collected in rather conspicuous patches. The flowers appear in many-flowered cymes, are yellow, and expand about 15^{mm}. Of the numerous stamens the inner dehiscence first, rising to the centre. The flowers are homogamous, with a chance of self-pollination. The homogamy, however, does not exist as a provision for self-pollination, though under certain conditions, it may be of advantage for this purpose; but is correlated with the fact that the flowers are devoid of nectar, and are visited exclusively for pollen.

Homogamy is a common characteristic of pollen-flowers, as well as of many highly organized flowers which secrete nectar and yield abundant pollen. The fact is that dichogamy acts disadvantageously in all cases in which a numerous set of visitors come exclusively for pollen, for these visitors neglect the flowers which are in the pistillate stage.

Hypericum cistifolium depends almost exclusively on bumble-bee females and workers, which visit it to collect pollen. On seven different days I noted them thus engaged. The species were: (1) *Bombus americanorum* F. ♀♂, ab.; (2) *B. pennsylvanicus* DeG. ♀; (3) *B. separatus* Cr. ♀♂, ab. On one occasion I saw the pollen collected by *Agapostemon bicolor* Rob. ♀. The flowers bloom from June 18 to July 22.

XANTHOXYLUM AMERICANUM Mill.—The northern prickly ash blossoms in early spring, and its blooming time is of short duration, Apr. 12th to 28th. The shrubs grow in small clumps and rise from 1–2^m. The greenish flowers are in small umbel-like clusters and are no more conspicuous than the young leaves

³See Todd: *Am. Nat.* 14: 668, and Trelease: *ibid.*, 731.

with which they appear; but insect visits are secured by abundant nectar secreted by the large gynobase. The corolla forms a loose tube about 2^{mm} long, beyond the tip of which the entire length of the conniving styles is exerted. The ovaries and the gynobase each occupy about half of this tube. The elevation of the ovaries gives them the novel function of obstructing the tube and to some extent concealing the nectar, and the most convenient passages to the nectar are the intervals between them. In the staminate flowers the gynobase is developed into a more widely expanded disc, with lobes extending between the filaments. In this form the nectar is concealed by the filaments and by the rudimentary ovaries. Access to it is most convenient between the filaments. Cross-fertilization between distinct plants is secured by dioecism. In spite of the inconspicuousness of the flowers abundant insect visits are insured.

This is a good illustration of the value of nectar as an entomophilous character of flowers. The secretion of nectar is, as a rule, all that is necessary to induce insect visits to flowers in natural situations and under fairly favorable conditions, and I am in the habit of disregarding the opinion that flowers are not frequently visited by insects in all cases where I am satisfied that nectar is secreted. When nectar alone is such an effective agent in securing insect visits the fact that flowers display even the least advertisement in the way of conspicuously colored parts is conclusive proof of the extreme importance of insect aid.

The following visitors of *Xanthoxylum* were taken on four days, between Apr. 12th and 19th:

HYMENOPTERA.—*Apidæ*: (1) *Apis mellifica* L. ♀, s. and c. p., ab.; (2) *Ceratina tejonensis* Cr. ♂, s.; (3) *Osmia lignaria* Say ♂♀, s., ab.; (4) *O. albiventris* Cr. ♂, s., ab.; (5) *Nomada luteola* Lep. ♂♀, s., ab.; (6) *N. maculata* Cr. ♂♀, s., ab.; *Andrenidæ*: (7) *Andrena sayi* Rob. ♂, s., ab.; (8) *A. pruni* Rob. ♂♀, s., freq.; (9) *A. cressonii* Rob. ♂♀, s., ab.; (10) *A. flavo-clypeata* Sm. ♂♀, s., ab.; (11) *A. rugosa* Rob. ♂, s.; (12) *A. mariæ* Rob. ♂, s.; (13) *A. claytoniæ* Rob. ♂♀, s., ab.; (14) *Halictus* sp. ♀, s.; (15) *H. gracilis* Rob. ♀, s., freq.; (16) *H. arcuatus* Rob. ♀, s.; (17) *H. lerouxii* Lep. ♀, s.; (18) *H. ligatus* Say ♀, s.; (19) *H. cressonii* Rob. ♀, s.; (20) *H. zephyrus* Sm. ♀, s., freq.; (21) *H. caeruleus* Rob. ♀, s., freq.; (22) *H. confusus* Sm. ♀, s., freq.; (23) *H. stultus* Cr. ♀, s. and c. p., ab.; (24)

Augochlora pura Say ♀, s.; (25) *Colletes inæqualis* Say ♂♀, s., ab.

DIPTERA.—*Syrphidæ*: (26) *Chrysogaster nitida* Wd.; (27) *Syrphus americanus* Wd.; (28) *Xanthogramma felix* O. S.; (29) *Mesograpta geminata* Say; (30) *Sphærophoria cylindrica* Say; (31) *Eristalis dimidiatus* Wd.; (32) *Helophilus similis* Mcq.; *Tachinidæ*: (33) *Jurinia apicifera* Wlk.; (34) *Gonia exul* Will., ab.; (35) *G. frontosa* Say, ab.; *Muscidæ*: (36) *Lucilia cæsar* L.; (37) *L. cornicina* F. freq.; *Cordyluridæ*: (38) *Scatophaga squalida* Mg.—all sucking.

LEPIDOPTERA.—*Noctuidæ*: (39) *Plusia simplex* Gn., s.

RHUS GLABRA L. — The greenish-yellow flowers are crowded in dense terminal panicles. Each flower forms a broad, shallow cup, in the bottom of which is situated a broad, yellow, five-lobed disc, which secretes nectar. In the pistillate flower access to the disc is impeded only by the style with its three large stigmas, and by small tufts of hairs on the inner faces of the five petals. In the staminate flower the disc is somewhat concealed by the large anthers.

As far as observed this species seems to be diœcious. In the patch of plants on which most of the insects were taken I found only pistillate flowers. I have also found patches in which all of the flowers appeared to be staminate, and in which, after the flowers fell, no fruit was to be seen, but only the naked axes of the panicles.

I have noted the flowers in bloom from June 8th to 24th. On account of the convenient nectar they are visited by numerous insects, mostly short-tongued Hymenoptera and Diptera, as shown in the following list, which contains insects noted on the flowers on three days, June 22d to 24th.

HYMENOPTERA.—*Apidæ*: (1) *Apis mellifica* L. ♀, s., ab.; (2) *Ceratina dupla* Say ♀, s. and c. p.; (3) *Heriades carinatum* Cr. ♂♀, s. and c. p.; *Andrenidæ*: (4) *Andrena crataegi* Rob. ♀, s.; (5) *Halictus arcuatus* Rob. ♀, s. and c. p., ab.; (6) *H. parallelus* Say ♀, s.; (7) *H. lerouxii* Lep. ♀, s.; (8) *H. fasciatus* Nyl. ♀, s.; (9) *H. pilosus* Sm. ♀, s. and c. p.; (10) *H. pruinosus* Rob. ♂♀, s.; (11) *H. confusus* Sm. ♂♀, s. and c. p., ab.; (12) *H. zephyrus* Sm. ♀, s. and c. p.; (13) *H. stultus* Cr. ♀, s. and c. p., ab.; (14) *Augochlora pura* Say ♀, s. and c. p.; (15) *Agapostemon bicolor* Rob. ♀, s. and c. p.; (16) *A. radiatus* Say ♀, s.; (17) *Colletes willistonii* Rob. ♂♀, s., freq.; (18)

C. eulophi Rob. ♂♀, s., freq.; (19) *Prosopis affinis* Sm. ♂, s. and f. p.; *Vespidæ*: (20) *Polistes metricus* Say, s.; *Eumenidae*: (21) *Odynerus anormis* Say, s.; *Crabronidae*: (22) *Oxybelus frontalis* Rob., s.; (23) *O. emarginatus* Say, s.; *Mimesidae*: (24) *Mimesa proxima* Cr., s.; *Philanthidae*: (25) *Cerceris robertsonii* Fox, s., freq.; (26) *C. compacta* Cr., s., freq.; *Sphecidae*: (27) *Ammophila gryphus* Sm., s.; (28) *A. vulgaris* Cr., s.; (29) *Isodontia philadelphica* Lep., s.; (30) *Priononyx thomæ* F., s.; *Pompilidae*: (31) *Pompilus marginatus* Say, s.; *Braconidae*: (32) *Vipio robertsonii* Ashm. (MS.), s.

DIPTERA.—*Empidae*: (33) *Empis* sp., s.; *Conopidae*: (34) *Physocephala tibialis* Say, s.; (35) *Zodion nanellum* Lw., s.; *Syrphidae*: (36) *Syrphus ribesii* L., s. and f. p.; (37) *S. americanus* Wd., s. and f. p.; (38) *Mesograpta marginata* Say, s. and f. p., freq.; (39) *M. geminata* Say, s. and f. p.; *Tachinidae*: (40) *Ocyptera euchenor* Wlk., s.; (41) *Jurinia apicifera* Wlk., s., ab.; (42) *J. smaragdina* Mcq., s.; (43) *Belvosia bifasciata* F., s.; (44) *Trichophora echinomoides* Twns., s.; (45) *Sarcomacronychia aurifrons* Twns., s.; (46) *Masicera* sp., s.; (47) *Acroglossa hesperidarum* Will., s.; *Sarcophagidae*: (48) sp., s.; (49–52) *Sarcophaga* spp., s.; *Muscidae*: (53) *Stomoxys calcitrans* L., s.; (54) *Lucilia cornicina* F., s.; (55) *L. sylvarum* Mg., s.; *Anthomyidae*: (56–57) *Chortophila* spp., s.

COLEOPTERA.—*Mordellidae*: (58) *Mordella marginata* Melsh., s.

Carlinville, Ill.